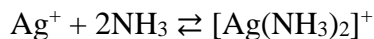


ANSWERS Solubility of solids in solutions forming a complex ion

1) Dissolving 0.0100g of silver chromate in 50 mL water will result in solid being present, as the required amount to make a saturated solution is 1.44×10^{-3} g in 50 mL, so any more than this will form a solid.

If the same mass is added to 50 mL of ammonia, more will dissolve and less solid will be present due to the formation of a complex ion.

The Ag_2CrO_4 will dissociate completely and form an equilibrium.



The silver ion will then react further with NH_3 , removing it from the above equilibrium. Thus, more Ag_2CrO_4 will dissolve to re-establish equilibrium.

$$2) K_s = [\text{Ag}^+][\text{Cl}^-]$$

$$1.56 \times 10^{-10} = [0.100][\text{Cl}^-]$$

$$[\text{Cl}^-] = 1.56 \times 10^{-9}$$

$$n = c \times V$$

$$= 1.56 \times 10^{-9} \times 5.00 \text{ mol}$$

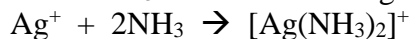
$$= 7.80 \times 10^{-9} \text{ mol}$$

$$m = n \times M$$

$$= 7.80 \times 10^{-9} \text{ mol} \times 58.5 \text{ g mol}^{-1}$$

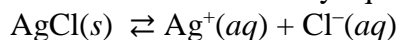
$$= 4.56 \times 10^{-7} \text{ g}$$

Dilute NH_3 will react with Ag^+ to produce the complex ion $[\text{Ag}(\text{NH}_3)_2]^+$.



This decreases $[\text{Ag}^+]$.

This moves the solubility equilibrium below to the right



increasing the solubility of AgCl / causing more AgCl to dissolve, therefore the **precipitate disappears**.